

CLAIMS

1. A method of extending an IP address block map, comprising:
defining a set of upper bound blocks;
using the set of upper bound blocks to partition a space of IP addresses into
5 territories, wherein each territory represents a largest set of IP addresses to which a piece
of mapping data may be extended;
defining a unanimity criterion that determines whether a set of mapping data are
sufficiently in agreement to be reduced to a single piece of mapping data; and
partitioning the territory of each upper bound block into a largest possible sub-
10 block in which the unanimity criterion is satisfied and extending the mapping data in each
such sub-block to all of the territory of that sub-block.

2. The method as described in Claim 1 wherein the upper bound blocks
comprise CIDR blocks contained in one or more BGP routing tables.

3. The method as described in Claim 1 wherein the upper bound blocks
comprise CIDR blocks contained in one or more BGP routing tables, with the CIDR blocks
being further subdivided according to geographic location.

4. The method as described in Claim 1 wherein the territory associated to an
IP address block includes all of the IP addresses belonging to that block.

5. The method as described in Claim 1 wherein the territory associated to an
IP address block includes all of the IP addresses belonging to that block that do not belong
25 to any more-specific upper bound block that is a sub-block of the given IP address block.

6. The method as described in Claim 1 wherein the unanimity criterion is that
a set of mapping data is unanimous if all data values in the set are equal.

7. The method as described in Claim 1 wherein the unanimity criterion is that a set of mapping data is unanimous if all data values are in the set are equal, disregarding those values which belong to a set of one or more special values that are treated as indifferent.

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8. The method as described in Claim 1 wherein the mapping data comprises network mapping decisions based on network probes.

9. The method as described in Claim 8 wherein the network probes comprise
10 ICMP packets.

10. A method of extending a sparse data set used for making request routing decisions, comprising:

determining whether routing decisions for a given set of name servers in a given IP address block are sufficiently in agreement;

5 if the routing decisions for the given set of name servers in the given IP address block are sufficiently in agreement, extending the routing decisions for at least one new name server; and

if the routing decisions for the given set of name servers in the given IP address block are not sufficiently in agreement, breaking the block into a largest possible sub-block

10 so that, in each sub-block, the routing decisions for a subset of name servers are sufficiently in agreement.

11. A method of extending an IP address block map, comprising:

for each of a set of one or more blocks:

- (a) determining whether given data therein satisfies a given criterion;
- (b) if the given data satisfies a given criterion, extending a routing decision to

5 all IP addresses in a given portion of the block while discarding data in more specific areas of the given portion; and

- (c) if the given data does not satisfy the given criterion, dividing the block into at least two sub-blocks; and
- (d) repeating steps (a)-(c) recursively for each of the sub-blocks.

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